

WHAT IS CLAIMED IS:

1. A system for activating an implant within a body, comprising:  
an external controller for contacting an exterior surface of a patient's body, the controller comprising a first acoustic transducer for transmitting a first acoustic signal  
5 into the patient's body, and an energy source for powering the first acoustic transducer;  
and  
an implant for placement within the patient's body, the implant comprising an electrical circuit configured for performing one or more commands when the implant is activated, an energy storage device, a switch coupled to the electrical circuit and the  
10 energy storage device, and a second acoustic transducer coupled to the switch, the second acoustic transducer configured for receiving the first acoustic signal from the first acoustic transducer, the switch being closed in response to the first acoustic signal to allow current flow from the energy storage device to the electrical circuit.
- 15 2. The system of claim 1, wherein the first acoustic transducer is configured for transmitting first and second acoustic signals separated by a predetermined delay, and wherein the switch is configured to close only when the second acoustic transducer receives the first and second acoustic signals separated by the predetermined delay.
- 20 3. The system of claim 1, wherein the controller comprises a processor for controlling the first acoustic transducer to transmit one of a first acoustic signal and a second acoustic signal, and wherein the switch is closed when the first acoustic signal is

received by the second acoustic transducer, and the switch being opened when the second acoustic signal is received by the second acoustic transducer for discontinuing current flow from the energy storage device to the electrical circuit.

5           4.       The system of claim 1, wherein the implant further comprises a sensor coupled to the electrical circuit, and wherein the one or more commands comprises measuring a physiological parameter within the body using the sensor.

10           5.       The system of claim 4, wherein the second acoustic transmitter is configured for transmitting a second acoustic signal comprising sensor data indicative of the physiological parameter to the controller, and the first acoustic transducer is configured for receiving the second acoustic signal from the implant.

15           6.       The system of claim 5, wherein the controller further comprises memory for storing the sensor data.

          7.       The system of claim 5, wherein the controller comprises a processor for extracting the sensor data from the second acoustic signal.

20           8.       The system of claim 5, wherein the controller comprises an interface for transferring the sensor data to an external electronic device separate from the controller.

9. The system of claim 1, further comprising a therapeutic device coupled to the electrical circuit, the electrical circuit being configured for controlling the therapeutic device in response to the physiological parameter measured by the sensor.

5 10. The system of claim 1, wherein the energy storage device comprises a rechargeable device, and wherein the system further comprises an external charger configured for placement against an exterior surface of the patient's body, the charger comprising a source of electrical energy, and a third acoustic transducer for converting electrical energy from the source of electrical energy into acoustic energy and  
10 transmitting a second acoustic signal comprising the acoustic energy into the patient's body.

11. The system of claim 10, wherein the second acoustic transducer is configured for converting the second acoustic signal into electrical energy for recharging  
15 the energy storage device.

12. The system of claim 1, further comprising an adhesive for securing the controller to an exterior surface of a patient's body.

20 13. The system of claim 1, wherein the controller is carried by a patch attachable to the patient's skin.

14. The system of claim 1, wherein the implant further comprises an actuator coupled to the electrical circuit, and wherein the one or more commands comprises activating the actuator to control a therapeutic device coupled to the actuator.

5 15. An apparatus for communicating with an implant located within a patient's body, the implant including one or more acoustic transducers configured for communicating using acoustic telemetry, comprising:

one or more acoustic transducers for converting between electrical energy and acoustic energy;

10 a controller coupled to the one or more acoustic transducers such that the one or more acoustic transducers are configured for at least one of transmitting acoustic signals to and receiving acoustic signals from within the patient's body to communicate with the implant;

an energy storage device for providing electrical energy to at least one of the  
15 controller and the one or more acoustic transducers; and

means for securing the one or more acoustic transducers to an exterior surface of a patient's body.

16. The apparatus of claim 15, wherein at least one of the acoustic transducers  
20 is configured for receiving acoustic signals from the implant within the patient's body.

17. The apparatus of claim 16, wherein the one or more acoustic transducers comprise a single acoustic transducer configured for transmitting acoustic signals to and receiving acoustic signals from the implant.

5 18. The apparatus of claim 16, wherein the controller comprises a processor for extracting data from acoustic signals received from the implant, and memory for storing the extracted data.

10 19. The apparatus of claim 16, wherein the controller comprises an interface for transferring the extracted data to an external electronic device.

20. The apparatus of claim 19, wherein the interface comprises at least one of a connector, a lead, and a wireless transmitter.

15 21. The apparatus of claim 16, wherein the means for securing comprises a flexible membrane carrying the one or more transducers, the controller, and the energy storage device.

20 22. The apparatus of claim 21, wherein the flexible membrane comprises a patch attachable to a patient's skin.

23. The apparatus of claim 21, wherein the flexible membrane comprises a layer of adhesive thereon for securing the flexible membrane to a patient's skin.

24. The apparatus of claim 16, wherein the means for securing comprises an  
5 adhesive.

25. The apparatus of claim 24, wherein the adhesive comprises at least one of hydrogel, silicon, polyurethane, polyethylene, polypropylene, and fluorocarbon polymer.

10 26. The apparatus of claim 16, further comprising an external charger configured for placement against an exterior surface of the patient's body, the charger comprising a source of electrical energy, and an acoustic transducer for converting electrical energy from the source of electrical energy into acoustic energy and transmitting the acoustic energy into the patient's body for energizing an energy storage  
15 device in the implant.

27. A method for communicating with an implant located within a patient's body, the implant comprising an acoustic transducer configured for communicating using acoustic telemetry, the method comprising:

20 securing a portable communications device in contact with an exterior surface of the patient's body, the communications device comprising one or more acoustic

transducers, and an energy storage device for providing electrical energy to operate the communications device; and

communicating with the implant using the one or more acoustic transducers.

5           28.     The method of claim 27, wherein the communicating step comprises transmitting one or more acoustic signals from the communications device into the patient's body, the one or more acoustic signals comprising a command for controlling operation of the implant.

10           29.     The method of claim 28, wherein the command comprises measuring a physiological parameter within the body.

15           30.     The method of claim 28, wherein the command comprises controlling a therapeutic device coupled to the implant.

          31.     The method of claim 27, wherein the communicating step comprises receiving one or more acoustic signals from the implant, the one or more acoustic signals comprising data indicative of a physiological parameter measured by the implant.

20           32.     The method of claim 31, further comprising extracting data from the one or more acoustic signals received from the implant.

33. The method of claim 32, further comprising storing the extracted data in memory of the communications device.

34. The method of claim 32, further comprising transferring the extracted data  
5 to an electronic device external to the patient's body.

35. The method of claim 31, further comprising charging the energy storage device with an energy source located outside the patient's body.

36. The method of claim 34, wherein the energy source comprises a charger  
10 that is separate from the communications device.

37. The method of claim 27, wherein the communications device comprises a patch carrying the one or more acoustic transducers, and wherein the securing step  
15 comprises securing the patch to the exterior surface of the patient's body.

38. The method of claim 37, wherein the one or more acoustic transducers are acoustically coupled to the patient's body when the patch is secured to the exterior surface of the patient's body.